

We claim:

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1. A biopsy forceps device for the taking of biological tissue samples from a body, comprising
 - a) a flexible main coil having distal and proximal ends;
 - b) articulable opposed first and second jaws hingedly disposed on said distal end of said main coil; and
 - c) actuation means having a distal end coupled to said first and second jaws, said actuation means for effecting articulation of at least one of said first and second opposed jaws, wherein

each said opposed first and second jaws is substantially hollow to permit the taking of biological tissue samples, and each said opposed first and second jaws has a distal portion having a substantially semicircular rim, said substantially semicircular rim having a radial array of substantially triangular ^{cutting} teeth extending ^{distally} regularly therefrom, wherein said radial array of substantially triangular teeth of said opposed first jaw extend toward said radial array of substantially triangular ^{cutting} teeth of said opposed second jaw and said substantially triangular ^{cutting} teeth of said opposed first jaw closely mesh with said triangular ^{cutting} teeth of said opposed second jaw when said opposed first and second jaws are in a closed position.

2. A biopsy forceps device according to claim 1, wherein: said opposed first and second jaws are identical.

3. A biopsy forceps device according to claim 2, wherein: said first and second jaws each have a longitudinal centerline, and for each jaw, said substantially triangular teeth on a first side of said longitudinal centerline are displaced by one half pitch from corresponding teeth on a second side of said longitudinal centerline.

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4. A biopsy forceps device according to claim 1, wherein:
said opposed first and second jaws further comprise a generally rear portion having a parallel line rim extending from said semicircular rim, said parallel line rim having a second array of substantially triangular teeth extending therefrom, wherein said second array of substantially triangular teeth of said opposed first jaw extend toward said second array of substantially triangular teeth of said opposed second jaw.
5. A biopsy forceps device according to claim 4, wherein:
said opposed first and second jaws are identical.
6. A biopsy forceps device according to claim 5, wherein:
said first and second jaws each have a longitudinal centerline, and for each jaw, said substantially triangular teeth of said first and second arrays on a first side of said longitudinal centerline are displaced by one half pitch from corresponding teeth of said first and second arrays on a second side of said longitudinal centerline.
7. A biopsy forceps device according to claim 6, wherein:
each of said opposed first and second jaws has a proximal end portion comprising a tang, with each tang having a recess thereon which articulably receives said distal end of said actuation means.
8. A biopsy forceps device according to claim 3, further comprising:
 - d) a handle means disposed on said proximal end of said main coil.

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9. A biopsy forceps device according to claim 8, wherein:

said actuation means has a proximal end, and

said handle means comprises

a central shaft having a longitudinal bore which receives said proximal end of said actuation means,

a spool having a central opening which receives said central shaft, and

a cross pin in said spool which engages said actuation means therein.

10. A biopsy forceps device according to claim 9, wherein:

said central shaft has a longitudinal bore of stepped configuration which lockably receives said actuation means in said main coil, and

said handle means further comprises a securement means about said main coil, said securement means comprising a locking means which locks said main coil in said stepped longitudinal bore.

11. A biopsy forceps device according to claim 10, wherein:

said locking means comprises a locking coil, and

said main coil is threadedly received in said locking coil in said longitudinal bore in said central shaft.

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12. A biopsy forceps device according to claim 6, wherein said actuation means has a proximal end, said biopsy forceps device further comprising:

d) a handle means disposed on said proximal end of said main coil, said handle means comprising

a central shaft having a longitudinal bore which receives said proximal end of said actuation means,

a spool having a central opening which receives said central shaft, and

a cross pin in said spool which engages said actuation means therein.

13. A biopsy forceps device according to claim 12, wherein:

said central shaft has a longitudinal bore of stepped configuration which lockably receives said actuation means in said main coil,

said handle means further comprises a securement means about said main coil, said securement means comprising a locking coil which locks said main coil in said stepped longitudinal bore, and

said main coil is threadably received in said locking coil in said longitudinal bore in said central shaft.

14. A biopsy forceps device according to claim 3, further comprising:

d) a handle means disposed on said proximal end of said main coil; and

e) a clevis means having distal and proximal ends, and having a pivot means in its distal end, said opposed first and second jaws being coupled to said pivot means and pivoting thereabout, and said proximal end of said clevis means being coupled to said distal end of said main coil.

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15. A biopsy forceps device according to claim 14, wherein:

said actuation means comprises a first and second pull wires disposed in said main coil, said first and second pull wires having proximal and distal ends, with said proximal ends of said first and second pull wires coupled to said handle means, and with said distal ends of said first and second pull wires respectively coupled to said opposed first and second jaws.

16. A biopsy forceps device according to claim 7, further comprising:

d) a handle means disposed on said proximal end of said main coil; and

e) a clevis means having distal and proximal ends, and having a pivot means in its distal end, said opposed first and second jaws being coupled to said pivot means and pivoting thereabout, and said proximal end of said clevis means being coupled to said distal end of said main coil.

17. A biopsy forceps device according to claim 16, wherein:

said actuation means comprises a first and second pull wires disposed in said main coil, said first and second pull wires having proximal and distal ends, with said proximal ends of said first and second pull wires coupled to said handle means, and with said distal ends of said first and second pull wires respectively coupled to said tang recess of said opposed first and second jaws.

18. A biopsy forceps device according to claim 3, wherein:

said opposed first and second jaws are formed of an investment cast material.

19. A biopsy forceps device according to claim 6, wherein:
said opposed first and second jaws are formed of an
investment cast material.

20. A biopsy forceps device according to claim 7, wherein:
said opposed first and second jaws are formed of an
investment cast material.

21. A medical instrument for insertion into a body comprising:
a) opposed first and second end effectors, at least one of said
first and second end effectors rotating around a first axis;
b) actuation means for effecting rotation of said at least one
of said first and second effectors which rotates around said first
axis, said actuation means having a wire means and a handle means,
said wire means having a distal end coupled to at least said
rotating end effector and a proximal end coupled to said handle
means, said handle means for effecting movement of said wire means
and thereby effecting rotation of said rotating end effector
means,
wherein said opposed first and second end effectors are cast
elements which are manufactured by casting.

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